



Summary of CPUC Actions to Support Zero-Emission Vehicle Adoption

The CPUC plays a critical role in supporting the state's transition to zero-emission vehicles (ZEVs).¹ As regulators of the state's electric investor-owned utilities (IOUs),² the CPUC applies its expertise and experience in electric rate design, electric system infrastructure deployment, grid management, and safety to support ZEV deployment. The CPUC also works closely with other state agencies to ensure electric IOU investments to support ZEVs are strategically coordinated and in the interest of ratepayers. The CPUC's activities fall into four main categories as described below:

- Electricity rates and costs of fueling
- Charging infrastructure deployment and incentives
- Vehicle-grid integration (VGI) policy and pilots
- Program evaluation and interagency coordination

California has established many transportation electrification (TE) goals to accelerate the adoption of ZEVs and increase access to charging stations which guide the CPUC's work on TE. In March 2012, former Governor Jerry Brown issued Executive Order B-16-12, establishing a target of reaching one million ZEVs on the road by 2025. The passage of Senate Bill (SB) 350 (de Leon, Chapter 547, Statutes of 2017)³ in 2015 directed the CPUC to work with the California Energy Commission (CEC) and the California Air Resources Board (CARB) to require the electric IOUs to develop proposals to accelerate widespread TE. Much of the CPUC's current ZEV work is focused on SB 350 implementation. Former Governor Brown later increased the state's ZEV deployment goal in January 2018 to five million ZEVs by 2030, including 250,000 public electric vehicle (EV) charging stations, 10,000 of which should be capable of fast charging EVs.⁴

Most recently in September 2020, Governor Newsom issued Executive Order N-79-20 to require all in-state sales of new passenger vehicles be zero-emission by 2035. The Executive Order also sets a further goal of the state that 100 percent of medium- and heavy-duty (MD/HD) vehicles in the state be zero-emission by 2045 for all operations where feasible, and by 2035 for drayage trucks. Further, it sets a goal of the state to transition to 100 percent zero-emission off-road vehicles and equipment by 2035 where feasible.

¹ California considers plug-in hybrid electric, full battery electric, hydrogen, and fuel cell vehicles to be zero-emission vehicles because they can have no greenhouse gas or air pollutant emissions from their tailpipes.

² The CPUC regulates six IOUs: Pacific Gas and Electric (PG&E), Southern California Edison (SCE), San Diego Gas & Electric (SDG&E), Liberty Utilities, PacifiCorp, and Bear Valley Electric Service.

³ Public Utilities Code §740.12 directs the CPUC to work with the California Energy Commission and the California Air Resources Board to direct the electric IOUs to develop proposals to accelerate widespread TE, which the law defines as "the use of electricity from external sources of electrical power, including the electrical grid, for all or part of vehicles, vessels, trains, boats, or other equipment that are mobile sources of air pollution and greenhouse gases and the related programs and charging and propulsion infrastructure investments to enable and encourage this use of electricity."

⁴ Executive Order B-48-18 <https://www.gov.ca.gov/2018/01/26/governor-brown-takes-action-to-increase-zero-emission-vehicles-fund-new-climate-investments/>



The TE projects to support ZEV adoption that the IOUs deploy are evaluated through the CPUC's public process. After stakeholders submit comments on the IOU proposal(s), CPUC Energy Division staff evaluates the proposals based on their merits and their alignment with state policies and environmental targets. Staff also analyzes whether the proposed budgets are appropriate, and whether the investments are in the interest of ratepayers, using information collected through the CPUC's public processes. Staff makes policy recommendations based on this analysis to Administrative Law Judges, who draft Proposed Decisions for the CPUC Commissioners vote. The Commissioners' votes determine whether the utility programs, budget, and implementation details are approved.

To date, the CPUC has authorized approximately \$1.45 billion in ratepayer spending on TE programs, with more investments likely to come. However, it is important to note that funding availability is only one of the many barriers to widespread TE. Other key barriers to effectively deploying this capital include long lead times for utility interconnection, infrastructure siting constraints and availability, permitting, Americans with Disabilities Act (ADA) compliance costs, available workforce, customer access, equity considerations, and general awareness of and interest in EVs. While funding is one critical metric, the CPUC is also working with other state agencies to address many of these other critical barriers.

Strategic Planning on ZEV Policy and Investments

In December 2018, the CPUC launched an Order Instituting Rulemaking to Continue the Development of Rates and Infrastructure for Vehicle Electrification (R.18-12-006, DRIVE rulemaking) to refocus its efforts related to TE, nearly a decade after opening its first rulemaking related to alternative-fueled vehicles in 2009.⁵ This current DRIVE rulemaking directed Energy Division staff to propose a framework for reviewing IOU roles and investment priorities for transportation electrification. In response, Energy Division staff issued a draft Transportation Electrification Framework (TEF) in February 2020⁶. The CPUC has since been engaged in the public stakeholder process to receive feedback on that proposal both through multiple rounds of comments and public workshops.

The TEF, if adopted by the CPUC, would require the IOUs to undertake a TE planning process to ensure that electric infrastructure will be able to support a massive influx of new EVs, would resolve policy issues previously raised on a case-by-case basis, would allow for more streamlined pilot and program review, would identify IOU priorities, and would provide a signal to third-party market participants about the IOUs' role in meeting the state's ZEV goals and managing the electric grid. The draft TEF utilizes lessons learned from past CPUC proceedings, program implementation, studies, and regulatory efforts underway at other state agencies, and research from other organizations.

⁵ The CPUC opened R.09-08-009 to support the widespread deployment and use of alternative fueled vehicles in 2009. That proceeding with folded into R.13-11-007 in 2013.

⁶ The draft TEF can be found at www.cpuc.ca.gov/zev



After completing its stakeholder engagement processes, the CPUC will vote out a decision (or decisions) on the TEF, TE planning, and related near-term investment priorities. An initial decision on the TEF is expected in the first half of 2021.

Electricity Rates and Costs of Fueling

Existing

Electricity rates for EV drivers

The CPUC has approved time-of-use (TOU) energy rates for residential customers of PG&E, SCE, SDG&E, Bear Valley, and Liberty Utilities that drive EVs and charge at home. TOU rates are designed to provide price signals to customers about when it is better to use electricity to optimize the use of grid resources and maintain reasonable rates and reliability. The rates and TOU periods vary by utility, but generally, the rates are lowest overnight, allowing drivers enough time to charge their EVs while they are at home. These “off-peak” rates allow EV drivers to fuel their vehicle for less than the equivalent cost of gasoline. Appendix A of this document includes details of the currently available EV rates offered by California IOUs.

In January 2018, the CPUC issued Decision (D.) 18-01-024,⁷ approving the first round of TE proposals filed pursuant to SB 350 with a total budget of \$42 million. This Decision also authorized SDG&E to develop a “public grid integration rate” for limited use as part of its Green Shuttle Pilot described in the infrastructure section below. It also approved an SDG&E Dealership Incentives pilot for SDG&E to train car dealerships and provide them incentives if customers who purchase an EV sign up for an SDG&E EV rate.

In June 2018, the CPUC issued D.18-05-040⁸ approving, among other programs, three new EV-specific rates:

- SCE’s three new commercial EV rates that offer a five-year holiday from monthly demand charges for customers that have adopted EVs. Demand charges are used to recover the IOU’s costs associated with the infrastructure needed to meet a customer’s maximum monthly demand and are in addition to charges for the electricity itself. Demand charges can increase significantly when customers start charging EVs and thus increase their demand. The five-year holiday period is intended to offer customers time to develop load management plans to mitigate demand charges, which SCE will phase back in over five years starting in year six of the rate’s availability. These three new rates, once implemented, will replace SCE’s existing commercial EV TOU rates listed in the table above.

In September 2018, the CPUC in D.18-09-034 approved Bear Valley’s EV TOU Pilot Rate that is designed for participants of its make-ready rebate program for destination centers as well as residential customers.

In 2019, the CPUC authorized PG&E to establish a new commercial EV rate via D.19-10-055. This new rate is designed to offer PG&E’s commercial and industrial customers—a group that includes transit fleet operators, owners of electric delivery trucks, and providers of public charging stations—the option to enroll in a subscription-based rate. This new rate eliminates demand charges and instead implements a subscription

⁷ Available here: <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M204/K670/204670548.PDF>.

⁸ Available here: <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M215/K783/215783846.PDF>.



model similar to a cell phone bill, with TOU volumetric energy charges that encourage customers to charge off-peak. Customers can “buy” a block of capacity that should meet their highest demand and then manage charging to not surpass it. The subscription charge is designed to replace demand charges and is paired with a TOU volumetric energy rate that offers lower prices for off-peak charging. SB 1000 (Lara, 2018) directs the CPUC to, within an existing proceeding, consider strategies to help customers transitioning to EVs reduce and manage demand charges, and this decision was a first step in the CPUC’s implementation of that legislative directive.

The CPUC approved a decision in April 2020, that authorized SDG&E to implement an interim rate waiver for its TOU-M rate. This decision allows SDG&E to offer its TOU-M rate to those that are adopting EVs or installing public EV charging stations.⁹ Without this stipulation, the TOU-M rate would be limited to customers under 40kW, and thus would not allow for these types of customers. The CPUC issued this decision as an interim solution while it reviews SDG&E’s application for an EV-specific commercial rate. However, the CPUC has since issued a decision that established SDG&E’s Electric Vehicle High Power Rate (EV-HP) for commercial and industrial customers.¹⁰ This December 2020 decision approved, with modifications, SDG&E’s proposal for a new rate for separately metered EV charging loads.

Submetering

The large IOUs implemented the Plug-In Electric Vehicle Submetering Pilot from 2014 through 2018, with two phases of the pilot. The pilot tested using energy meters specifically for EV charging (separate from the house’s meter) to help drivers save on fuel costs, allow them to enroll on TOU rates while keeping their homes on tiered rates, and allowed drivers to avoid paying to install a new utility meter just for their EV. In 2019, Energy Division staff hosted a public workshop to discuss the results of the Plug-In Electric Vehicle Submetering Pilot. In 2020, the CPUC directed the IOUs to commence work on drafting a Plug-In Electric Vehicle Submetering Protocol that they must submit by December 2020. A decision on submetering is expected in 2021.

Resale of Electricity

Providers of both light-duty and medium- and heavy-duty charging services are not regulated as public utilities. The CPUC issued a decision in 2020 that extended a previous CPUC determination that providers of light-duty charging services are not public utilities to providers of medium- and heavy-duty EV charging services, and off-road EV or off-road electric equipment charging services.¹¹

Future

Through the DRIVE rulemaking, R.18-12-006, the CPUC directs the six IOUs to jointly propose ZEV rates that specifically address demand charges associated with hosting direct-current fast charging (DCFC) stations¹² or

⁹ D.20-04-009: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M334/K729/334729024.PDF>

¹⁰ [D.20-12-023](#)

¹¹ [D.20-09-025](#)

¹² DCFC stations directly provide a high-power DC current (typically 120kW or more) to a vehicle’s battery without converting the power to AC. Sites hosting DCFC face high demand charges associated with the infrastructure needed to service the high-power associated with their charging stations, and are often unable to fully recover their demand charge costs due to low utilization of the DCFC.



deploying fleets of ZEVs, including electric buses or other commercial vehicle fleets. The TEF also includes a proposal for the IOUs to develop dynamic rates.

In its decision authorizing its new commercial subscription rate, the CPUC directed PG&E to file an application for a dynamic rate option for these customers no later than 12 months after that decision became effective. In compliance with that decision, PG&E filed a proposal with the CPUC for a dynamic rate in October 2020.¹³ This proposal is currently under review. **Infrastructure Deployment and Incentives**

Existing

Electric IOU charging infrastructure pilots and programs to support light-duty EVs¹⁴

Beginning in 2014, the CPUC determined that it would allow IOUs to propose programs to use ratepayer funding to invest in and own TE infrastructure.¹⁵ The three largest IOUs – PG&E, SCE, and SDG&E – filed applications in 2014 for pilots to install light-duty EV charging stations at workplaces, apartment buildings, and some destination centers such as community colleges and golf courses. The CPUC approved the utilities' pilots in 2016.¹⁶ The three IOU pilots were initially authorized to install the infrastructure to support a total of up to 12,500 charging stations (mostly Level 2) with initial budgets up to \$197 million.¹⁷

In December 2018, the CPUC authorized SCE to spend an additional \$22M on its light-duty infrastructure pilot program,¹⁸ Charge Ready, to build at least 1,000 more Level 2 chargers while the CPUC reviewed SCE's application for Charge Ready 2.

In August 2020, the CPUC approved the largest single-utility EV charging program in the country by authorizing up to \$436 million for SCE to fund approximately 37,800 EV chargers.¹⁹ The bulk of the budget will go toward expanding SCE's Charge Ready pilot to build make-ready infrastructure for Level 2 charging at apartments, workplaces, and some destination centers. Additional funds will go towards allowing SCE to own the make-ready and charging station at apartments in disadvantaged communities (DACs), towards building

¹³ A.20-10-011

¹⁴ Light-duty electric vehicles are passenger vehicles typically used by residential customers and fleets operated by workplaces, government agencies or transportation network companies.

¹⁵ CPUC Decision (D.)14-12-079 available at

<http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M143/K682/143682372.PDF>

¹⁶ D.16-01-023 approved \$22 million for SCE's Charge Ready program to install infrastructure and provide rebates for up to 1,500 charging stations at multi-unit dwellings, workplaces, and destination centers; D.16-01-045 approved \$45 million for SDG&E's Power Your Drive program to install, own, and operate up to 3,500 charging stations at multi-unit dwellings and workplaces; and D.16-12-065 approved \$130 million for PG&E's EV Charge Network program to install infrastructure and provide rebates for up to 7,500 charging stations at multi-unit dwellings and workplaces. PG&E is authorized to own and operate up to 35 percent of the charging states installed through EV Charge Network.

¹⁷ Level 1 charging is plugging the EV into a standard 110-volt outlet to recharge the battery. Level 2 charging stations are connected to a 240-volt outlet and provide a faster charging option than Level 1.

¹⁸ D.18-12-006: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M252/K522/252522607.PDF>

¹⁹ D.20-08-045: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M346/K230/346230115.PDF>



out DCFCs to serve customers who do not have access to home charging, towards installing Level 2 charging at apartments that are under construction, and marketing, education, and outreach programs.

Each electric IOU convenes a program advisory council (PAC) comprised of representatives from state agencies, ratepayer advocates, environmental justice groups, technology providers, automakers, and others to provide feedback and guidance on pilot design and implementation.

The costs of most of the IOUs' TE programs (except those funded by LCFS revenues) are collected through electric distribution rates paid by all electric ratepayers in the utility's territory.

SB 350 Pilots and Programs

In January 2018, the CPUC approved twelve new electric IOU infrastructure pilots pursuant to SB 350 with budgets totaling \$43 million.²⁰ Many of these pilots focus on deploying charging infrastructure:

- **SDG&E Airport Ground Support Equipment:** develop a plan to install charging infrastructure for various ground support equipment and integrate charging with onsite solar generation.
- **SDG&E Electrify Local Highways:** install and own 88 charge points: 20 Level 2 charging stations and two DC fast chargers at each of four Park-and-Ride locations.
- **SDG&E Port Electrification:** install and own approximately 30 charging stations and supporting infrastructure
- **SDG&E Fleet Delivery Services:** install and own charging infrastructure to support 90 delivery trucks
- **SDG&E Green Shuttle:** install and own Level 2 and/or DC fast charging to meet shuttle needs
- **SCE Residential Make-Ready Rebate:** provide up to 5,000 rebates for residential customers to cover the infrastructure upgrades needed to install Level 2 charging stations
- **SCE Urban DCFC Clusters:** install up to 50 new DCFC ports to offer options for drivers without access to home charging
- **SCE Electric Transit Bus Make-Ready:** install make-ready charging infrastructure and provide rebate for charging station
- **SCE Port of Long Beach Pilots:** install make-ready charging infrastructure to support port equipment
- **PG&E Medium/Heavy-Duty Fleet Customer Demonstration:** install make-ready infrastructure and provide technical assistance to a transit agency
- **PG&E Electric School Bus Renewables Integration:** install make-ready infrastructure for 2 to 5 school buses and provide incentives to charge buses at times of day with excess renewable energy generation
- **PG&E Idle Reduction Technology:** develop a plan to demonstrate idle-reduction technologies for truck stop electrification or transport refrigeration units

As part of this decision, the CPUC's Safety and Enforcement Division drafted a Safety Checklist²¹ for the electric IOUs to ensure their projects meet certain standards. This checklist will evolve overtime as the CPUC develops lessons learned and identifies additional safety needs.

²⁰ Project summaries and budgets are available here:

<http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442455977>.



In May 2018, the CPUC adopted D.18-05-040, authorizing another \$738 million in IOU infrastructure investments pursuant to SB 350, with a further set aside of \$29.5 million for evaluation of the projects.²² The Decision authorized PG&E and SCE to spend \$210 million and \$343 million, respectively, to install infrastructure to support medium- and heavy-duty EVs such as semi-trucks, transit and school buses, fleet delivery trucks, and port equipment. PG&E is also authorized to spend up to \$22.4 million to install infrastructure for 234 DCFC ports that will offer faster public charging options.

In September 2018, the CPUC issued D.18-09-034, authorizing the three smaller IOUs to spend approximately \$7.3 million on TE programs related to infrastructure deployment:

- **Bear Valley EV TOU Pilot Rate:** install make-ready infrastructure for residential and commercial EV customers to take service on a new TOU rate
- **Bear Valley Destination Make-Ready rebate (\$607,500):** provide rebates for the make-ready infrastructure for Level 2 charging at public destinations
- **Liberty Utilities DC Fast Charger Project (\$4 million):** deploy and operate DCFC stations
- **Liberty Utilities Residential Make-Ready Rebate (\$1.6 million):** offer rebates for residential customers installing Level 2 charging stations
- **Liberty Utilities Small Business Make-Ready Rebate (\$300,000):** offer rebates for small business customers installing Level 2 charging stations
- **Liberty Utilities Bus Infrastructure Program (\$223,000):** install and operate charging equipment for Tahoe Transit District electric buses
- **Liberty Utilities Customer Online Resource Project (\$240,480):** develop a customer resource providing information about the benefits of EVs and enrolling in EV TOU rates
- **PacifiCorp Demonstration and Development Grant Program (\$270,000):** provide grants for non-residential charging installations
- **PacifiCorp Outreach and Education Program (\$170,000):** test the effectiveness of a variety of EV outreach and education programs, including mass-media, ride-and-drives, and online resources

In 2019, the CPUC authorized SDG&E to spend more than \$107 million to support the installation of charging infrastructure for medium- and heavy duty EVs.²³ SDG&E must spend at least 30 percent of its program budget in disadvantaged communities. The program is expected to electrify approximately 3,000 vehicles ranging from forklifts to school buses to semi-trucks.

Also in 2019, the CPUC authorized PG&E to spend up to \$4 million to establish a program, EV Empower,²⁴ to provide rebates to low- and moderate-income residential customers that install Level 2 charging stations at home, as well as upgrade electrical panels if necessary.

For the programs approved under SB 350 to date, the three large IOUs are required to continue utilizing the PACs that were already providing guidance on the implementation of their light-duty infrastructure

²¹ The Safety Checklist is available at www.cpuc.ca.gov/sb350te

²² More information about the programs approved in D.18-05-040 is available at <http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442457607>.

²³ D.19-08-026: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M311/K550/311550050.PDF>

²⁴ D.19-09-006: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M314/K145/314145047.PDF>



programs. The smaller IOUs are required to host meetings with stakeholders, especially small businesses, to ensure the programs do not exclude participation due to customer size.

Assembly Bills 1082 and 1083 (Burke, Chapter 637 & 638, Statutes of 2017)

Assembly Bills 1082 and 1083 (Burke, 2017) allowed, but did not require, the electric IOUs to file applications to support charging infrastructure at schools and state parks and beaches, respectively. The bills required the electric IOUs to submit applications by July 30, 2018. The CPUC issued guidance to the electric IOUs regarding any applications they elect to submit pursuant to the bills, and on July 30, 2018 the CPUC received applications for programs from four IOUs: Liberty, PG&E, SCE, and SDG&E.

In 2019, the CPUC approved a total of \$54.5 million for PG&E, SCE, SDG&E, and Liberty Utilities for a total of eight pilot programs to install up to 800 charging ports at parks, beaches, and schools. The four IOUs are expected to start implementing the pilots in early 2021.

NRG Settlement

The CPUC entered into a legal settlement agreement with NRG Energy to settle outstanding legal issues regarding the California energy crisis. EVgo implemented the settlement requirements on behalf of NRG. The settlement required NRG to invest more than \$100 million in EV charging infrastructure in California:

- \$50.5 million for 200 public fast charging stations²⁵
- \$27.5 million to \$40 million for approximately 6,875 make-ready stubs²⁶
- \$12.5 million for at least 10 DCFC charging plazas, sited to serve residents of apartment buildings²⁷
- \$5 million for research and development pilots
- \$4 million to support underserved communities

The implementation period for the NRG Settlement is complete, and a final audit is underway.

Assembly Bill (AB) 841 (Ting, 2020)

The CPUC is in the process of implementing AB 841 (Ting, 2020) which, among other things, mandates certain changes to the way in which the CPUC oversees and regulates TE investments. The bill directed the CPUC to approve proposals from the IOUs to establish new Electric Rules or tariffs that authorize each IOU to design and deploy all utility-side electrical distribution infrastructure for customers installing separately metered EV charging, excluding charging in single family homes.

On January 15, 2021, Commissioner Rechtschaffen released an Assigned Commissioner Ruling (ACR) seeking party feedback on implementation questions on and interpretations of AB 841 and its requirements.

²⁵ Each of the required 200 “Freedom Stations” must have at least 1 DCFC and 1 Level 2 charger, or 2 DCFCs.

²⁶ The original target for make-readies, prior to the Second Amendment to the Settlement, was 10,000 make-ready stubs at 1,000 facilities. A portion of this budget was reallocated to the Charging Plazas.

²⁷ Each charging plaza must have at least three DCFCs and must be located in areas of high multi-unit dwelling concentration.



Pursuant to the statutory requirement that AB 841 established, all six IOUs submitted proposals to the CPUC to establish these new Electric Rules on February 28, 2021. These proposals are currently under review and the CPUC plans to vote out a policy decision in response to these proposals by June 30, 2021, consistent with the statutory deadline.

Future

The CPUC recently released a proposed decision approving and modifying an application from SDG&E to expand its light-duty infrastructure pilot, Power Your Drive.²⁸ The proposed decision would authorize SDG&E to spend \$43.5 million to build at least 2,000 additional Level 2 charging ports for light-duty vehicles at apartment buildings and workplaces. However, the proposed decision adds additional cost containment measures to reach higher port targets. The CPUC is currently scheduled to vote on the proposed decision at its March 18, 2021, meeting.

Low Carbon Fuel Standard

Low Carbon Fuel Standard Rebates

In 2016, PG&E, SCE, and SDG&E began providing rebates to EV drivers through the state's Low Carbon Fuel Standard (LCFS).²⁹ EV drivers generate LCFS credits by using low carbon fuel (electricity), and the utilities receive credits on behalf of their customers.³⁰ When the utilities sell the credits, they use the revenues to distribute rebates and on-bill credits to their residential customers that drive an EV, effectively lowering a driver's cost to purchase or operate the EV. Rebates amounts have varied across each IOU program, and year to year based on the number of LCFS credits generated in each utility service territory and the price the utilities can charge for the LCFS credits they are selling.

Since 2018, the CPUC has been working with CARB to establish a new point-of-purchase rebate program funded by LCFS credits attributed to all of the state's utilities—IOWs and publicly owned utilities (POUs). In August 2019, the CPUC authorized SCE to serve as the interim administrator for the statewide utility-run program, the Clean Fuel Reward.³¹ This program is funded by all of the state's participating utilities, with the IOUs contributing 67 percent of their LCFS credit revenue associated with EVs. The Clean Fuel Reward program takes the place of the IOUs other on-bill credit and rebate programs, and is expected to launch to customers purchasing an EV in the Fall of 2020.

In December 2020, the CPUC issued a decision developed in consultation with CARB that outlines how the IOUs can spend LCFS credit revenues that exceed their contributions to the Clean Fuel Reward program.³² The decision on these remaining funds—also called the “holdback” funds—focuses funding towards TE programs

²⁸ A.19-10-012

²⁹ Additional information on the CPUC's implementation of Low Carbon Fuel Standard rebates is available here: <http://www.cpuc.ca.gov/zev/#Rebates>.

³⁰ The California Air Resources Board calculates the number of credits generated and allocates the LCFS credits.

³¹ Resolution E-5015: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M311/K266/311266079.PDF>

³² [D.20-12-027](#)



addressing equity and resiliency. The decision requires the IOUs to spend 35 percent of their holdback funds on equity projects in 2021, 45 percent in 2022, 55 percent in 2023, and 75 percent in 2024 and thereafter. The decision includes certain requirements depending on the program area the IOUs choose to pursue to ensure the projects are not duplicative of other TE efforts, address barriers to TE, and demonstrate collaboration with environmental justice groups and community-based organizations. For the holdback funds not spent on these equity program areas, the IOUs are directed to spend up to 20 percent of annual holdback revenue to implement programs to address EV resiliency (e.g., EV charging facilities at evacuation/emergency response centers, pilots for technologies that allow EVs to power electric equipment at home or businesses). **Vehicle-Grid Integration Policy and Pilots**

The CPUC, in collaboration with other state agencies, is developing policies that support vehicle-grid integration (VGI). VGI helps align EV charging with the needs of the electric system. To do this, EVs must have capabilities to manage charging or support two-way interaction between vehicles and the grid. In 2014, CPUC staff issued a VGI Whitepaper, and supported CAISO's development of the state's VGI Roadmap.

VGI Working Group

In 2017, CPUC staff initiated a public working group to assess whether the adoption of a communication protocol is necessary to enable VGI resources to more economically participate in electricity markets at scale.³³ More than 130 international experts participated in the working group process, which consisted of 15 facilitator-led meetings throughout 2017. The final Working Group report and staff recommendations were included as an appendix to R.18-12-006 in 2018.³⁴

The CPUC Energy Division staff led a follow up VGI Working Group designed to better identify the costs and benefits associated with VGI use cases. This working group, which the DRIVE rulemaking directed Energy Division to launch, aimed to build off the 2017 working group deliverables to identify (1) which VGI use cases provide the most value, (2) how that value can be captured, and (3) what new policies or procedures are needed for VGI to provide value at scale.³⁵ In August 2019, Energy Division staff launched the VGI Working Group again with eighty-five participants. They included CARB, the CAISO, CEC, utilities, community choice aggregators (CCAs), EV manufacturers, battery manufacturers, charging network and energy service providers, advocacy and research groups, ratepayer advocates, and industry groups.

³³ Information about and deliverables from the working group are available at <http://www.cpuc.ca.gov/vgi/>.

³⁴ The final Energy Division Staff Report on the VGI Communication Protocols Standards Working Group is Appendix C, available at <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M252/K033/252033222.pdf>

³⁵ The VGI working group is ordered within R.18-12-006, and the three large IOUs are required to work with Energy Division staff to develop the work plan and kick off the working group no later than July 31, 2019.



A resulting report, the June 30, 2020 VGI Working Group Report,³⁶ provided 90 policy recommendations in response to the question: what policies need to be changed or adopted to allow additional VGI use cases to be deployed in the future.

VGI Pilots

The CPUC has also overseen several electric IOU pilots to explore VGI applications, including demand response pilots using EVs to shift or curtail load,³⁷ pilots to explore managed charging, and pilots that have examined use cases and technological feasibility of vehicle-to-grid (V2G).

Senate Bill (SB) 676 (Bradford, 2019)

In 2019, SB 676 (Bradford, 2019) created new requirements for all IOU TE programs to maximize achievable VGI benefits by 2030 and directed the CPUC to issue guidance on VGI strategies and metrics no later than December 31, 2020.

In the pursuit of implementing SB 676, the draft TEF released in February 2020 also included recommendations on VGI implementation. The CPUC issued a supplemental VGI Staff Paper³⁸ to stakeholders in August 2020, requesting additional stakeholder feedback. Many of these stakeholders have also been engaged in the VGI Working Group.

In December 2020, the CPUC issued a decision regarding VGI implementation strategies and quantifiable metrics that meet the criteria of SB 676.³⁹ The decision establishes a foundation for efforts to maximize VGI, which includes authorization of up to \$35 million in funding for pilots to overcome barriers to VGI that are technically feasible, but not yet commercially available, and up to \$10 million over two years for market evaluation and lab-scale technology testing. Further, the decision requires the use of certain VGI strategies in other TE programs moving forward.

VGI Roadmap

The CPUC will continue to support VGI efforts by participating in the VGI Roadmap update process, which the CEC is leading as part of its Integrated Energy Policy Report. The CEC is working with the CPUC, the CAISO, CARB, and other stakeholders to complete the VGI Roadmap update.

Future Work

Pursuant to the CPUC decision implementing SB 676, the IOUs may request approval to access funds to implement VGI pilots by July 2021. Additionally, that decision directed the IOUs to submit proposals to establish their VGI emerging technology programs by May 2021. The CPUC will review these proposals following their submittal.

Program Evaluation and Interagency Coordination

The utilities are required to provide reports on their light-duty infrastructure pilots on a quarterly or bi-annual basis. Reports include metrics like number of ports and sites installed and customers served by the

³⁶ [VGI Working Group Report](#)

³⁷ Additional pilot summaries are available here: http://www.cpuc.ca.gov/zev/#Pilot_Programs.

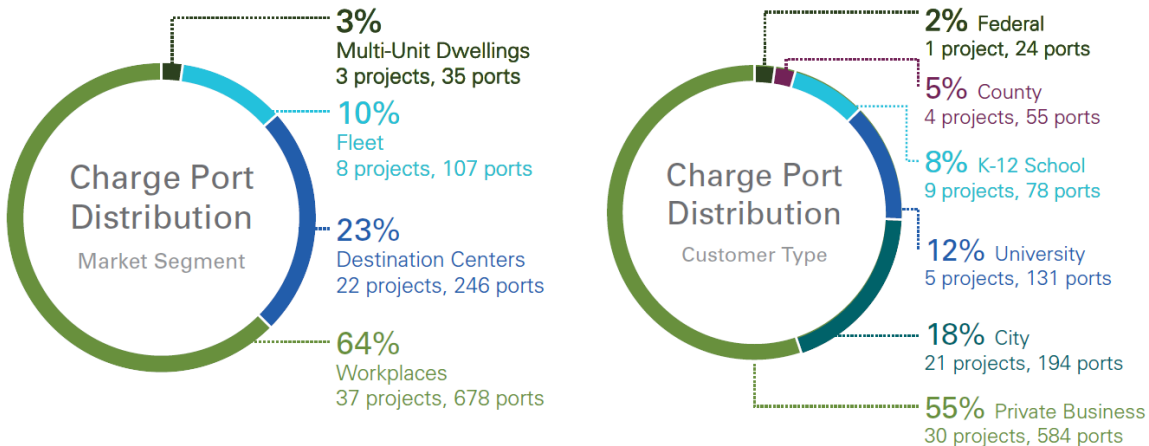
³⁸ [VGI Staff Paper](#)

³⁹ [D.20-12-029](#)



installations, such as those shown in Figure 1, which shows the breakdown of location types and customers who participated in SCE's Charge Ready Pilot.

Figure 1.



Source: SCE Charge Ready Phase 1 Final Report⁴⁰

The decisions approving the SB 350 programs adopted standardized data collection and reporting templates.

⁴¹ The data and information collected through these templates will be reviewed by an independent third-party evaluator. The metrics collected on the SB 350 programs will also include charging station utilization rates, number of EVs adopted as a result of the program, avoided petroleum usage, and criteria air pollutant reductions. The CPUC has adopted a similar data collection and evaluation approach with its approval of SCE's Charge Ready 2 program.⁴²

Interagency Coordination

CPUC Energy Division staff regularly engage with staff from CARB, the CAISO, CEC, and the Governor's Office of Business Development (GO-Biz) to discuss ZEV initiatives. Coordination activities include regular meetings to discuss each agency's policies and programs to support ZEV charging infrastructure, forecasts of vehicle adoption, data collection efforts, and discussions of measuring the emissions reductions associated with state ZEV policies.

Meetings with other California state agencies deploying complementary ZEV policies and regulations are also ongoing to help coordinate data collection and reporting efforts as well as compliance deadlines.

⁴⁰ Available at https://www.sce.com/wps/wcm/connect/48270afc-aa77-4e4c-9cb1-bb2dcb8b5f66/5227_SCE_ChargeReadyReportSummary_r4-AA.pdf?MOD=AJPERES&attachment=false&id=1525298577774

⁴¹ Data collection and reporting templates for the SB 350 programs are available at www.cpuc.ca.gov/sb350te

⁴² D.20-08-045



In 2018, California state agencies collaboratively updated the California ZEV Action Plan to clearly identify priorities for advancing the ZEV market and serve as a “to-do” list for the governor’s office and agency staff.⁴³ The CPUC has supported the development of the ZEV Market Development Action Plan that was released in January 2021.

Further, the recent Executive Order from Governor Newsom requires GO-Biz to lead the efforts with the CPUC, CARB, CEC, CalTrans, Department of Finance, and other state and local agencies to develop a ZEV Market Development Strategy by January 31, 2021.⁴⁴ The Executive Order also requires GO-Biz to update this every three years. The CPUC will be engaged in this process.

Internal CPUC Coordination

CPUC staff working on ZEV issues regularly interact with other CPUC teams to ensure ZEV policies are integrated into the CPUC’s larger electricity sector planning frameworks and align with CPUC priorities for the transportation sector:

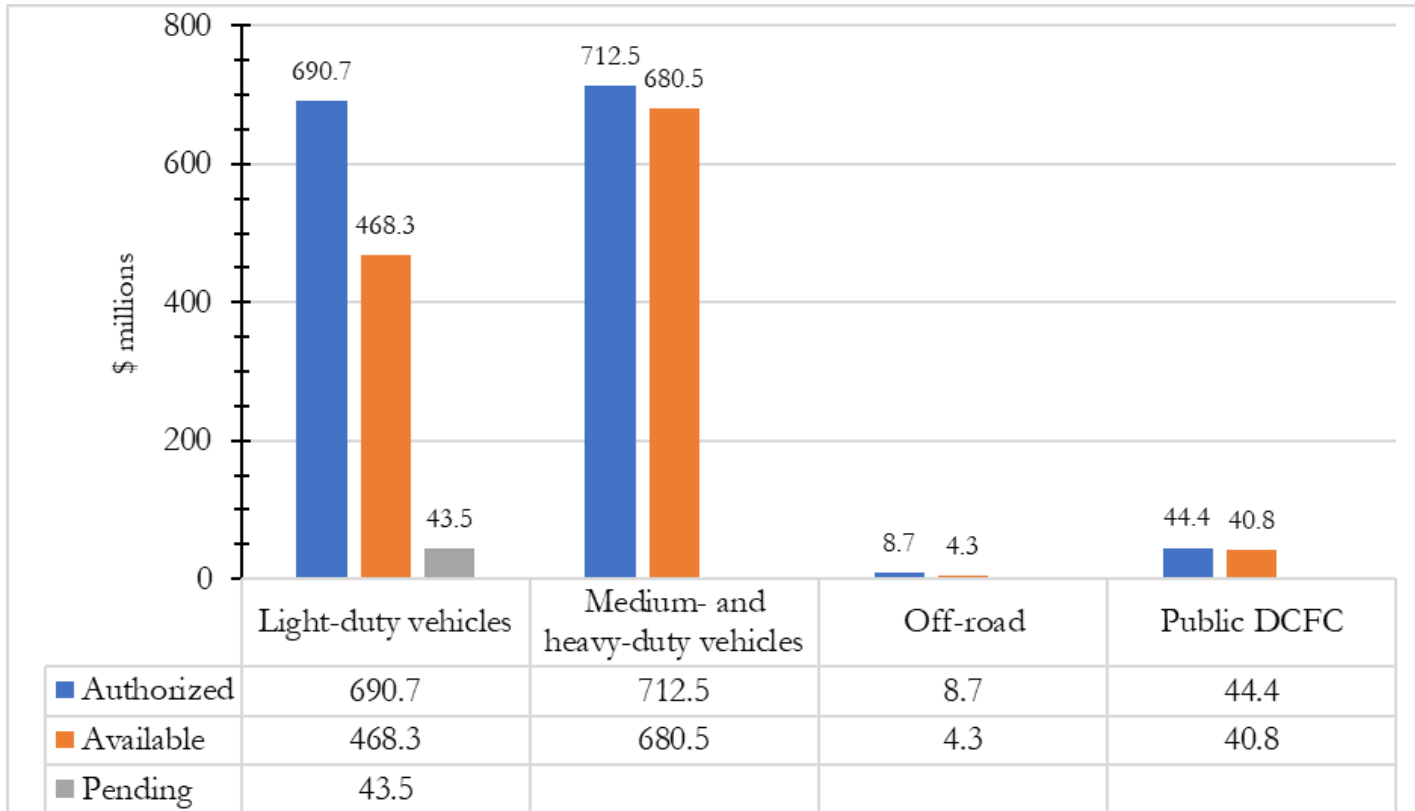
- Electric Rate Design
- Integrated Resource Planning
- Distribution Resource Planning
- Distributed Energy Resources Action Plan
- Demand Response
- Energy Program Investment Charge (EPIC)
- Interconnection
- Transportation Network Companies (TNCs)
- Autonomous Vehicles
- Safety and Enforcement

⁴³The 2018 ZEV Action Plan is available at <http://business.ca.gov/Portals/0/ZEV/2018-ZEV-Action-Plan-Priorities-Update.pdf>.

⁴⁴ The ZEV Market Development Strategy must do the following: (1) ensure coordinated and expeditious implementation of the system of policies, programs, and regulations necessary to achieve the goals and order established by the Executive Order; and (2) outline State agencies’ actions to support new and used ZEV markets for broad accessibility for all Californians.



Appendix A: IOUs' Transportation Electrification Infrastructure Investments as of February 2021⁴⁵



⁴⁵ Includes all six IOUs—both small and large.



Appendix B: Electric Vehicle Rate Structures

Bear Valley Electric Service

BVES TOU-EV-1⁴⁶

Residential

EV only

Summer: May 1 to October 31

On-Peak	Hour	Summer Prices (\$/kWh)
	Start	4:00 PM
	End	9:59 PM
Off-Peak	Hour	Summer Prices (\$/kWh)
	Start	10:00 PM
	End	8:59 AM
Super Off-Peak	Hour	Summer Prices (\$/kWh)
	Start	9:00 AM
	End	3:59 PM
Demand Charge: (\$/kw)	N/A	
Customer Charge:(i.e. \$/month or \$/meter)	N/A	

Winter: November 1 to April 30

On-Peak	Hour	Winter Prices (\$/kWh)
	Start	5:00 PM
	End	10:59 PM
Off-Peak	Hour	Winter Prices (\$/kWh)

⁴⁶ Tariff available at https://www.bves.com/media/managed/ratechange010119/Sch_TOU_EV_1_354_E_Revised.pdf
(Accessed January 16, 2020)



	Start	11:00 PM	\$0.12704
	End	8:59 AM	
Super Off-Peak		Hour	Winter Prices (\$/kWh)
	Start	9:00 AM	\$0.09074
	End	4:59 PM	
Demand Charge: (\$/kw)	N/A		
Customer Charge:(i.e. \$/month or \$/meter)	N/A		

BVES TOU-EV-2⁴⁷

Commercial

EV only

Summer: May 1 to October 31

On-Peak		Hour	Summer Prices (\$/kWh)
Off-Peak	Start	4:00 PM	\$0.18149
	End	9:59 PM	
		Hour	Summer Prices (\$/kWh)
	Start	10:00 PM	\$0.13612
	End	8:59 AM	
	Super Off-Peak		Hour
	Start	9:00 AM	\$0.09074
	End	3:59 PM	

⁴⁷ Tariff available at https://www.bves.com/media/managed/ratechange010119/Sch_TOU_EV_2_354_E_Revised.pdf
(Accessed on January 16, 2020)



Demand Charge: (\$/kw)	N/A		
Customer Charge:(i.e. \$/month or \$/meter)	N/A		

Winter: November 1 to April
30

On-Peak		Hour	Winter Prices (\$/kWh)
	Start	5:00 PM	\$0.31446
	End	10:59 PM	
Off-Peak		Hour	Winter Prices (\$/kWh)
	Start	11:00 PM	\$0.12704
	End	8:59 AM	
Super Off-Peak		Hour	Winter Prices (\$/kWh)
	Start	9:00 AM	\$0.09074
	End	4:59 PM	
Demand Charge: (\$/kw)	N/A		
Customer Charge:(i.e. \$/month or \$/meter)	N/A		

BVES TOU-EV-3⁴⁸

Commercial

⁴⁸ Tariff available at https://www.bves.com/media/managed/ratechange010119/Sch_TOU_EV_3_354_E_Revised.pdf
(Accessed on January 16, 2020)



EV only

Summer: May 1 to October 31

On-Peak		Hour	Summer Prices (\$/kWh)
Off-Peak	Start	4:00 PM	\$0.18149
	End	9:59 PM	
		Hour	Summer Prices (\$/kWh)
	Start	10:00 PM	\$0.13612
	End	8:59 AM	
Super Off-Peak		Hour	Summer Prices (\$/kWh)
	Start	9:00 AM	\$0.09074
	End	3:59 PM	
Demand Charge: (\$/kw)		9.00	
Customer Charge:(i.e. \$/month or \$/meter)		N/A	

Winter: November 1 to April 30

On-Peak		Hour	Winter Prices (\$/kWh)
	Start	5:00 PM	\$0.31446
	End	10:59 PM	
Off-Peak		Hour	Winter Prices (\$/kWh)
	Start	11:00 PM	\$0.12704
	End	8:59 AM	
Super Off-Peak		Hour	Winter Prices (\$/kWh)
	Start	9:00 AM	\$0.09074
	End	4:59 PM	



Demand Charge: (\$/kw)	9.00		
Customer Charge:(i.e. \$/month or \$/meter)	N/A		



Liberty Utilities

Liberty Utility EV TOU Domestic Service (TOU D-1 EV)⁴⁹

Residential

Whole House

On-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	10:01 a.m.	\$0.13768	5:01 p.m.	
	End	10:00 p.m.		10:00 p.m.	
Mid-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	n/a	n/a	7:01 a.m.	
	End	n/a		5:00 p.m.	
Off-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	10:01 p.m.	\$0.08042	10:01 p.m.	
	End	10:00 a.m.		7:00 a.m.	
Demand Charge: none					
Customer Charge: \$13.43 per month					

Note: Winter is October through May. Summer is June through September.

Liberty Utility EV TOU Small General Service (TOU A-1 EV)⁵⁰

Small Commercial

Whole Facility

On-Peak	Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
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⁴⁹ Tariff available at <https://california.libertyutilities.com/uploads/LU-CA%20March%201%20Revised%20Tariffs/D1%20TOU%20EV%20March%201.pdf> (Accessed on January 16, 2020)

⁵⁰ Tariff available at <https://california.libertyutilities.com/uploads/LU-CA%20March%201%20Revised%20Tariffs/A1%20TOU%20EV.pdf> (Accessed January 16, 2020)



	Start	10:01 a.m.	\$0.15633	5:01 p.m.	\$
	End	10:00 p.m.		10:00 p.m.	
Mid-Peak		Hour	Summer Prices (\$/kWh)		Winter Prices (\$/kWh)
	Start	n/a	n/a	7:01 a.m.	\$
	End	n/a		5:00 p.m.	
Off-Peak		Hour	Summer Prices (\$/kWh)		Winter Prices (\$/kWh)
	Start	10:01 p.m.	\$0.10524	10:01 p.m.	\$
	End	10:00 a.m.		7:00 a.m.	
Demand Charge: None					
Customer Charge: \$20.21 per month					

Note: Winter is October through May. Summer is June through September.

Liberty Utility Small General Service (A-1)⁵¹

Small Commercial

Whole Facility

On-Peak		Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
	Start		\$0.15633	\$0.15633
	End			
Mid-Peak		Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
	Start		\$0.15633	\$0.15633
	End			
Off-Peak		Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)

⁵¹ Liberty Utilities has proposed to apply its A-1 tariff to DCFC sites in its service territory until it implements a DCFC specific rate. Draft Resolution E-5042 was circulated to the service list of A.17-06-031 et al, and is on the CPUC February 6, 2020 voting agenda. Tariff available at <https://california.libertyutilities.com/uploads/CPUC%20Sheet%20107-109%20-%20Schedule%20No.%20A-1.pdf> (Accessed on January 16, 2020).



	Start		\$0.15633	\$0.15633
	End			
Demand Charge: none				
Customer Charge: \$15.29				

Note: Interim rate for DCFCs. There is one rate for all usage.



Pacific Gas and Electric

PG&E EV-A⁵²

Residential

Whole House

On-Peak	Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)	
	Start	2pm	\$0.54121	\$0.37957
	End	9pm		
Mid-Peak	Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)	
	Start	7am and 9pm	\$0.29567	\$0.23289
	End	2pm and 11pm		
Off-Peak	Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)	
	Start	11pm	\$0.14232	\$0.14567
	End	9am		
Demand Charge: none				
Customer Charge: none				

Note: Peak hours are 3pm to 7pm on weekends and holidays. Partial peak hours do not apply weekends and holidays. Rates effective 1/1/20.

Summer Season is May through October (6 months)

Winter Season is November through April (6 months)

EV-A is only available to solar customers eligible for legacy Time-of-Use treatment. Other customers moved to EV2-A.

⁵² EV-A has closed for new enrollments. Tariff available at [https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_SCHS_EV%20\(Sch\).pdf](https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_SCHS_EV%20(Sch).pdf) (Accessed on January 16, 2020).



PG&E EV-B⁵³

Residential

EV only

On-Peak	Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
Start	2pm	\$0.53525	\$0.37322
	End		
Mid-Peak	Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
Start	7am and 9pm	\$0.29269	\$0.22971
	End		
Off-Peak	Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
Start	11pm	\$0.14189	\$0.14521
	End		
Demand Charge: none			
Customer Charge: \$1.50/month			

Note: Peak hours are 3pm to 7pm on weekends and holidays. Partial peak hours do not apply weekends and holidays. Rates effective 1/1/20.

Summer Season is May through October (6 months)

Winter Season is November through April (6 months)

EV-B is currently available but is expected to be displaced by Schedule EV2B, which is not currently available.

⁵³ Tariff available at [https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_SCHS_EV%20\(Sch\).pdf](https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_SCHS_EV%20(Sch).pdf) (Accessed January 16, 2020).



PG&E EV2-A⁵⁴

Residential

Whole House

On-Peak		Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
	Start	4pm	\$0.48179	\$0.35468
	End	9pm		
Mid-Peak		Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
	Start	3pm and 9pm	\$0.37130	\$0.33798
	End	4pm and 12am		
Off-Peak		Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
	Start	12am	\$0.16928	\$0.16928
	End	3pm		
Demand Charge: none				
Customer Charge: none				

Note: Time periods apply every day. Rates effective 1/1/20.

Summer Season is June through September (4 months)

Winter Season is October through May (8 months)

⁵⁴ Tariff available [https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_SCHS_EV2%20\(Sch\).pdf](https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_SCHS_EV2%20(Sch).pdf) (Accessed on January 16, 2020).



PG&E

BEV-1

Commercial < 100kW

EV only

On-Peak		Hour	Prices (\$/kWh)	
	Start	4pm		\$0.32858
	End	9pm		
Off-Peak		Hour	Prices (\$/kWh)	
	Start	2pm and 9pm		\$0.13657
	End	4pm and 9am		
Super Off-Peak		Hour	Prices (\$/kWh)	
	Start	9am		\$0.10991
	End	2pm		
		Subscription Charge: \$12.41 per 10kW. Overage charge of \$2.48/kW		
Customer Charge: none				

Note: Tariff not expected to be available until 5/1/20.

Rates set at values that would be applied under 1/1/20 revenue requirements.

Rates do not vary by season.

**PG&E BEV-2****S**Commercial > 100kW, Secondary
voltage

EV only

On-Peak	Hour	Prices (\$/kWh)
Start	4pm	\$0.34490
	End	
Off-Peak	Hour	Prices (\$/kWh)
Start	2pm and 9pm	\$0.13167
	End	
Super Off-Peak	Hour	Prices (\$/kWh)
Start	9am	\$0.10840
	End	
Subscription Charge: \$95.56 per 50kW. Overage charge of \$3.82/kW		
Customer Charge: none		

Note: Tariff not expected to be available until 5/1/20. Rates set at values that would be applied under 1/1/20 revenue requirements.

Rates do not vary by season.

**PG&E BEV-
2 P**Commercial > 100kW, Primary
voltage



EV only

On-Peak	Hour	Prices (\$/kWh)
Start	4pm	\$0.33694
End	9pm	
Off-Peak	Hour	Prices (\$/kWh)
Start	2pm and 9pm	\$0.12806
End	4pm and 9am	
Super Off-Peak	Hour	Prices (\$/kWh)
Start	9am	\$0.10540
End	2pm	
Subscription Charge: \$85.98 per 50kW. Overage charge of \$3.44/kW		
Customer Charge: none		

Note: Tariff not expected to be available until 5/1/20. Rates set at values that would be applied under 1/1/20 revenue requirements.

Rates do not vary by season.



Southern California Edison

TOU-D Option PRIME⁵⁵

Residential

Whole-house

On-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	4 p.m.	\$0.39314	N/A	N/A
	End	9 p.m.		N/A	
Mid-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	4 p.m.	\$0.27479	4 p.m.	\$0.35943
	End	9 p.m.		9 p.m.	
Off-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	9 p.m.	\$0.13577	9 p.m.	\$0.12932
	End	4 p.m.		8 a.m.	
Super Off-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	N/A	N/A	8 a.m.	\$0.12932
	End	N/A		4 p.m.	
Non-seasonal Components					
Customer Charge:(\$/day)			\$0.39500		

Note: Summer season is June through September. Mid-peak rates in summer only apply on weekends in lieu of On-peak rates.

TOU-EV-7⁵⁶

⁵⁵ Tariff available at https://library.sce.com/content/dam/sce-doclib/public/regulatory/tariff/electric/schedules/residential-rates/ELECTRIC_SCHEDULES_TOU-D.pdf. (Accessed on January 16, 2020).



Commercial, mthly. max demand <= 20kW

EV only - Separately metered

On-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	4 p.m.	\$0.41056	N/A	N/A
	End	9 p.m.		N/A	
Mid-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	4 p.m.	\$0.29776	4 p.m.	\$0.31791
	End	9 p.m.		9 p.m.	
Off-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	9 p.m.	\$0.14839	9 p.m.	\$0.14030
	End	4 p.m.		8 a.m.	
Super Off-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	N/A	N/A	8 a.m.	\$ 0.08496
	End	N/A		4 p.m.	
Demand Charge: (\$/kW)			\$ -		\$ -
Non-seasonal Components					
Customer Charge:(\$/day)			\$0.34700		
Three-Phase Service (\$/day)			\$0.03100		
Voltage Discount - Energy (\$/kWh)					

⁵⁶ Tariff available at https://library.sce.com/content/dam/sce-doclib/public/regulatory/tariff/electric/schedules/general-service-&-industrial-rates/ELECTRIC_SCHEDULES_TOU-EV-7.pdf (Accessed on January 16, 2020).



From 2 kV to 50 kV	\$(0.00197)		
From 51 kV to 219 kV	\$(0.02395)		
220 kV and above	\$(0.04851)		

Note: Summer season is June through September. Mid-peak rates in summer only apply on weekends in lieu of On-peak rates. This tariff has two options: Option E with no demand charge and Option D. The rates for both options are the same as demand charges are set to zero until March 1, 2024 and will phase-in thereafter.

TOU-EV-8⁵⁷

Commercial, mthly. max demand > 20 kW and <= 500 kW

EV only - Separately metered

On-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	4 p.m.	\$0.49738	N/A	N/A
	End	9 p.m.		N/A	
Mid-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	4 p.m.	\$0.25694	4 p.m.	\$0.29831
	End	9 p.m.		9 p.m.	
Off-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	9 p.m.	\$0.12710	9 p.m.	\$0.13700
	End	4 p.m.		8 a.m.	
Super Off-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)

⁵⁷ Tariff available at https://library.sce.com/content/dam/sce-doclib/public/regulatory/tariff/electric/schedules/general-service-&-industrial-rates/ELECTRIC_SCHEDULES_TOU-EV-8.pdf (Accessed on January 16, 2020).



	Start	N/A	N/A	8 a.m.	\$0.07865
	End	N/A		4 p.m.	
Demand Charge: (\$/kW)			\$ -		\$ -
Non-seasonal Components					
Customer Charge:(\$/meter/month)			\$117.96000		
Voltage Discount - Demand (\$/kW)					
From 2 kV to 50 kV			\$ -		
From 51 kV to 219 kV			\$ -		
220 kV and above			\$ -		
Voltage Discount - Energy (\$/kWh)					
From 2 kV to 50 kV			\$(0.00201)		
From 51 kV to 219 kV			\$(0.02619)		
220 kV and above			\$(0.04902)		
Power Factor Adjustment (\$/kVAR)					
Greater than 50 kV			\$0.54000		
50 kV or less			\$0.60000		

Note: Summer season is June through September. Mid-peak rates in summer only apply on weekends in lieu of On-peak rates. Demand charges are set to zero until March 1, 2024 and will phase-in thereafter.

TOU-EV-9 (Below 2kV)⁵⁸

Commercial, mthly. max demand > 500 kW

⁵⁸ Tariff available at https://library.sce.com/content/dam/sce-doclib/public/regulatory/tariff/electric/schedules/general-service-&-industrial-rates/ELECTRIC_SCHEDULES_TOU-EV-9.pdf (Accessed on January 16, 2020).



EV only - Separately metered

On-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	4 p.m.	\$0.44227	N/A	N/A
	End	9 p.m.		N/A	
Mid-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	4 p.m.	\$0.22135	4 p.m.	\$0.25703
	End	9 p.m.		9 p.m.	
Off-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	9 p.m.	\$0.10703	9 p.m.	\$0.11285
	End	4 p.m.		8 a.m.	
Super Off-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	N/A	N/A	8 a.m.	\$0.06890
	End	N/A		4 p.m.	
Demand Charge: (\$/kW)			\$ -		\$ -
Non-seasonal Components					
Customer Charge: (\$/meter/month)			\$433.47000		
Power Factor Adjustment (\$/kVAR)			\$0.60000		

Note: Summer season is June through September. Mid-peak rates in summer only apply on weekends in lieu of On-peak rates. Demand charges are set to zero until March 1, 2024 and will phase-in thereafter.

TOU-EV-9 (Below 2kV)⁵⁹

Commercial, mthly. max demand > 500 kW

⁵⁹ Tariff available at https://library.sce.com/content/dam/sce-doclib/public/regulatory/tariff/electric/schedules/general-service-&-industrial-rates/ELECTRIC_SCHEDULES_TOU-EV-9.pdf (Accessed on January 16, 2020).



EV only - Separately metered

On-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	4 p.m.	\$0.44227	N/A	N/A
	End	9 p.m.		N/A	
Mid-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	4 p.m.	\$0.22135	4 p.m.	\$0.25703
	End	9 p.m.		9 p.m.	
Off-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	9 p.m.	\$0.10703	9 p.m.	\$0.11285
	End	4 p.m.		8 a.m.	
Super Off-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	N/A	N/A	8 a.m.	\$0.06890
	End	N/A		4 p.m.	
Demand Charge: (\$/kW)			\$ -		\$ -
Non-seasonal Components					
Customer Charge:(\$/meter/month)			\$433.47000		
Power Factor Adjustment (\$/kVAR)			\$0.60000		

Note: Summer season is June through September. Mid-peak rates in summer only apply on weekends in lieu of On-peak rates. Demand charges are set to zero until March 1, 2024 and will phase-in thereafter.

TOU-EV-9 (From 2kV to 50kV)⁶⁰

Commercial, mthly. max demand > 500 kW

⁶⁰ Tariff available at https://library.sce.com/content/dam/sce-doclib/public/regulatory/tariff/electric/schedules/general-service-&-industrial-rates/ELECTRIC_SCHEDULES_TOU-EV-9.pdf (Accessed on January 16, 2020).



EV only - Separately metered

On-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	4 p.m.	\$0.40891	N/A	N/A
	End	9 p.m.		N/A	
Mid-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	4 p.m.	\$0.20129	4 p.m.	\$0.23603
	End	9 p.m.		9 p.m.	
Off-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	9 p.m.	\$0.09854	9 p.m.	\$0.10323
	End	4 p.m.		8 a.m.	
Super Off-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	N/A	N/A	8 a.m.	\$0.06493
	End	N/A		4 p.m.	
Demand Charge: (\$/kW)			\$ -		\$ -
Non-seasonal Components					
Customer Charge:(\$/meter/month)			\$231.24000		
Power Factor Adjustment (\$/kVAR)			\$0.60000		

Note: Summer season is June through September. Mid-peak rates in summer only apply on weekends in lieu of On-peak rates. Demand charges are set to zero until March 1, 2024 and will phase-in thereafter.

TOU-EV-9 (Above 50kV)⁶¹

Commercial, mthly. max demand > 500 kW

⁶¹ Tariff available at https://library.sce.com/content/dam/sce-doclib/public/regulatory/tariff/electric/schedules/general-service-&-industrial-rates/ELECTRIC_SCHEDULES_TOU-EV-9.pdf (Accessed on January 16, 2020).



EV only - Separately metered

On-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	4 p.m.	\$0.30422	N/A	N/A
	End	9 p.m.		N/A	
Mid-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	4 p.m.	\$0.11772	4 p.m.	\$0.15389
	End	9 p.m.		9 p.m.	
Off-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	9 p.m.	\$0.07972	9 p.m.	\$0.08353
	End	4 p.m.		8 a.m.	
Super Off-Peak		Hour	Summer Prices (\$/kWh)	Hour	Winter Prices (\$/kWh)
	Start	N/A	N/A	8 a.m.	\$0.05749
	End	N/A		4 p.m.	
Demand Charge: (\$/kW)			\$ -		\$ -
Non-seasonal Components					
Customer Charge:(\$/meter/month)			\$1,597.39000		
Voltage Discount - Demand (\$/kW)					
			0		
Voltage Discount - Energy (\$/kWh)					
220kV and above			\$(0.00693)		
Power Factor Adjustment (\$/kVAR)			\$0.54000		



Note: Summer season is June through September. Mid-peak rates in summer only apply on weekends in lieu of On-peak rates. Demand charges are set to zero until March 1, 2024 and will phase-in thereafter.



San Diego Gas & Electric

SDG&E Schedule EV-TOU⁶²

Residential

EV-only

On-Peak	Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
	Start 4:00pm (Everyday)	\$0.55279	\$0.30540
	End 9:00pm (Everyday)		
Off-Peak	Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
	Start All other hours excluding 10:00 am to 2:00 pm on weekdays in March and April	\$0.33796	\$0.29767
	End All other hours excluding 10:00 am to 2:00 pm on weekdays in March and April		
Super Off-Peak	Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
	Midnight		
	Start 10:00 am in March and April (Weekdays)	\$0.19319	\$0.19392
	End 6:00 am 2:00 pm in March and April (Weekdays) 2:00 pm (Weekends & Holidays)		

⁶² Tariff available at <https://www.sdge.com/sites/default/files/regulatory/1-1-20%20Schedule%20EV-TOU%20%26%20EV-TOU-2%20Total%20Rates%20Tables.pdf> (Accessed on January 16, 2020).



Notes:

Rate levels as of Jan. 1, 2020

Minimum bill: \$0.338/day

SDG&E Schedule EV-TOU-2⁶³

Residential

Whole-house

On-Peak	Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
Start	4:00pm (Everyday)	\$0.55279	\$0.30540
End	9:00pm (Everyday)		
Off-Peak	Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
Start	All other hours excluding 10:00 am to 2:00 pm on weekdays in March and April	\$0.33795	\$0.29766
End	All other hours excluding 10:00 am to 2:00 pm on weekdays in March and April		
Super Off-Peak	Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
Start	Midnight 10:00 am in March and April (Weekdays)	\$0.19319	\$0.19392

⁶³ Tariff available at <https://www.sdge.com/sites/default/files/regulatory/1-1-20%20Schedule%20EV-TOU%20%26%20EV-TOU-2%20Total%20Rates%20Tables.pdf> (Accessed on January 16, 2020).



	6:00 am
	2:00 pm in March and April (Weekdays)
End	2:00 pm (Weekends & Holidays)

Notes:

Rate levels as of Jan. 1, 2020

Minimum bill: \$0.338/day


SDG&E Schedule EV-TOU-5⁶⁴

Residential

Whole-house

On-Peak		Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
	Start	4:00pm (Everyday)	\$0.50411	\$0.25672
	End	9:00pm (Everyday)		
Off-Peak		Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
	Start	All other hours excluding 10:00 am to 2:00 pm on weekdays in March and April	\$0.28927	\$0.24898
	End	All other hours excluding 10:00 am to 2:00 pm on weekdays in March and April		
Super Off-Peak		Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
	Start	Midnight 10:00 am in March and April (Weekdays)	\$0.08558	\$0.08631
	End	6:00 am 2:00 pm in March and April (Weekdays) 2:00 pm (Weekends & Holidays)		
Customer		\$16/month		

⁶⁴ Tariff available at <https://www.sdge.com/sites/default/files/regulatory/1-1-20%20Schedule%20EV-TOU-5%20Total%20Rates%20Table.pdf> (Accessed on January 16, 2020).



Charge:

Note:

Rate levels as of Jan. 1, 2020

SDG&E Schedule VGI⁶⁵

Medium/Large Commercial & Industrial (> 20 kW)

EV-Only

On-Peak	Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
	Start N/A	N/A	N/A
	End N/A		
Off-Peak	Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
	Start N/A	N/A	N/A
	End N/A		
Super Off-Peak	Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
	Start N/A	N/A	N/A
	End N/A		
Demand Charge: (\$/kw)		N/A	
Customer Charge:		N/A	
		\$	
Total Base Rate: (\$/kWh)		0.14	
CAISO day-ahead hourly price (\$/kWh)	updated daily, day-ahead		

⁶⁵ Tariff available at http://www.sdge.com/tm2/pdf/ELEC_ELEC-SCHDS_VGI_2018.pdf (Accessed on January 16, 2020).



CAISO day-of hourly adjustment for surplus energy (\$/kWh)	updated daily, same day
VGI day-ahead C-CPP Hourly Adder (if applicable) (\$/kWh)	\$ 0.49
VGI day-ahead D-CPP Hourly Adder (if applicable) (\$/kWh)	\$ 0.60

Notes:



SDG&E EV-HP Rate⁶⁶

Commercial and Industrial

EV-Only

	Unit	EV-HP Illustrative Rate	
		Year 1	Year 11
Basic Service Fee (<=500 kW)	\$ Per Month	\$186.30	\$186.30
Basic Service Fee (> 500 kW)	\$ Per Month	\$744.64	\$744.64
Subscription Charge (<= 150 kW)	\$/10 KW/Month	\$37.79	\$103.61
Subscription Charge (> 150 kW)	\$/10 KW/Month	\$94.48	\$259.03
CPP Event Period Adder	\$ per kWh	\$1.32	\$1.98
Summer On-Peak	\$ per kWh	\$0.23	\$0.41
Summer Off-Peak	\$ per kWh	\$0.12	\$0.16
Summer Super Off-Peak	\$ per kWh	\$0.07	\$0.11
Winter On-Peak	\$ per kWh	\$0.22	\$0.39
Winter Off-Peak	\$ per kWh	\$0.11	\$0.15
Winter Super Off-Peak	\$ per kWh	\$0.07	\$0.11
Peak/SOP(summer) Ratio		\$3.30	\$3.92

⁶⁶ For EV-HP, the rates change annually.


SDG&E Schedule Public GIR⁶⁷

Medium/Large Commercial & Industrial (> 20 kW)

EV-Only

On-Peak	Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
Start	N/A	N/A	N/A
End	N/A		
Off-Peak	Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
Start	N/A	N/A	N/A
End	N/A		
Super Off-Peak	Hour	Summer Prices (\$/kWh)	Winter Prices (\$/kWh)
Start	N/A	N/A	N/A
End	N/A		
Demand Charge: (\$/kw)		N/A	
Customer Charge:		N/A	
Total Base Rate: (\$/kWh)		\$0.16	
CAISO day-ahead hourly price (\$/kWh)	Updated daily, day-ahead		
CAISO day-of hourly adjustment for surplus energy (\$/kWh)		\$0.49	
VGI day-ahead C-CPP Hourly			

⁶⁷ Tariff available at http://regarchive.sdge.com/tm2/pdf/ELEC_ELEC-SCHEDS_PUBLIC_GIR.pdf (Accessed on January 16, 2020).



Adder (if applicable) (\$/kWh)	\$0.24
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Note: Applicable for participants in Green Shuttles Priority Review Project only